

BIOHACK NOTES



# BIOMOLECULES

- BASED ON ACTIVE RECALL AND SPACED REPETITION
- TARGET 360/360 IN NEET BIOLOGY & 100/100 IN BOARDS!



**PARTH** GOYAL





## • INTRODUCTION

1. To find the composition of elements in living tissue, we take a liver and grind it in \_\_\_\_\_ using a mortar or pestle.
2. We strain the slurry through a \_\_\_\_\_ or \_\_\_\_\_ we would obtain two fractions.
3. Elements which are present in more % in human body than in earth crust are (5)
4. Amino acids are substituted \_\_\_\_\_
5. Acidic amino acid ex (2) -
6. Basic amino acids ex (2) -
7. Neutral amino acid ex (5) -
8. Aromatic amino acid ex (3) -
9. Zwitter means \_\_\_\_\_. This property is present in -
10. Palmitic acid has \_\_\_\_\_ carbons excluding the carboxyl group.
11. 20 carbons are present in \_\_\_\_\_
12. Glycerol is chemically \_\_\_\_\_
13. Gingelly oil has a high melting point. T/F
14. Ex of phospholipids. (2) (NEET)
15. Phospholipids are found in \_\_\_\_\_
16. Neural tissues have more complex lipids like \_\_\_\_\_ which have \_\_\_\_\_ instead of glycerol as backbone.
17. Sphingomyelin is a type of \_\_\_\_\_ which consists of \_\_\_\_\_ as head group.
18. Nitrogenous bases when attached to sugar form \_\_\_\_\_ and when attached also to \_\_\_\_\_ form nucleotides.
19. Nucleoside version of adenine is called \_\_\_\_\_
20. Nucleoside version of cytosine is called \_\_\_\_\_
21. Flavonoids are primary metabolites. T/F
22. Types of secondary metabolites are (9)
23. Example of Pigment (2)
24. Example of Alkaloids (2) (NEET)
25. Ex. of Terpenoids (2)
26. Ex of Essential Oils (2) (NEET)
27. Curcumin is a \_\_\_\_\_ type of secondary metabolite.
28. Ex of Toxins (2) (NEET)
29. Concanavalin A is a \_\_\_\_\_
30. Ex of Drugs (2) (NEET)



31. Ex of Polymeric substance (3)

32. No secondary metabolites have ecological importance. T/F

33. Compounds found in the acid soluble pool have molecular weights ranging from \_\_\_\_ to \_\_\_\_ daltons.

34. 4 Types of compounds in acid insoluble pool are -

35. Define biomacromolecules.

36. Acid insoluble pool have molecular weight in the range of \_\_\_\_\_ or above.

37. Lipids are not strictly \_\_\_\_\_

38. The acid soluble pool represent roughly the composition of \_\_\_\_\_

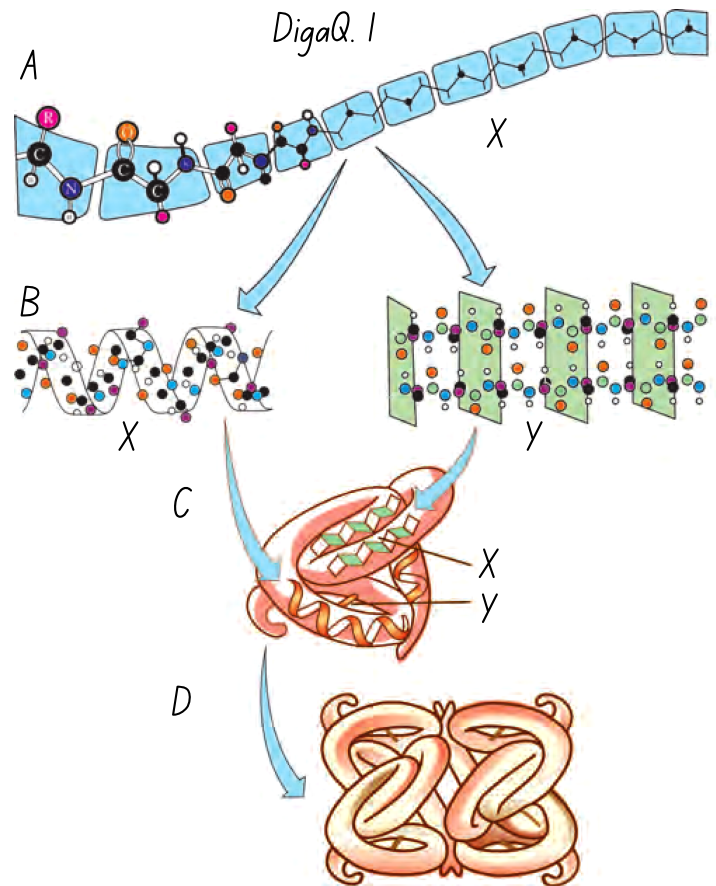
39. \_\_\_\_\_ is present 10-15 % in cell.

40. Carbohydrates are \_\_\_\_% of total cell mass.

41. Lipids are \_\_\_\_% of total cell mass.

42. Nucleic acids are \_\_\_\_% of total cell mass.

43. Water % in cell is -



## • PROTEIN, POLYSACCHARIDE NUCLEIC ACIDS

44. Protein is a homopolymer/heteropolymer.

45. Name all the essential amino acids (10)

46. Fxn of GLUT-4 is - (NEET)

47. \_\_\_\_\_ is the most abundant protein in animal world. (NEET)

48. \_\_\_\_\_ is the most abundant protein in the whole biosphere.

49. Inulin is a polymer of \_\_\_\_\_

50. In a polysaccharide chain, the right end is called the reducing/non-reducing end.

51. Cellulose forms helical secondary structures. T/F

52. Starch hold I<sub>2</sub> molecules in the \_\_\_\_\_

53. The starch-I<sub>2</sub> is \_\_\_\_\_ in color.

54. Exoskeleton of arthropods have polysaccharide called \_\_\_\_\_

55. Ex of amino sugars (2)

56. Chitin is a homo/heteropolysaccharide made of \_\_\_\_\_

57. A and G are substituted \_\_\_\_\_

58. In deoxyribose, the oxygen is removed from \_\_\_\_ position.

59. Right end is represented as a first/last amino acid.

60. N-terminal amino acid is the first/last amino acid.



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61. Secondary structures ex (2) -

62. \_\_\_\_\_ structure is absolutely necessary for many biological activities of protein.

63. Ex of tertiary structure (1)

64. Ex of quaternary structure (1)

65. No. of peptide bond present in a tripeptide is -

66. In nucleotides, the bond between phosphate and hydroxyl is a \_\_\_\_\_ type of bond.

67. Phosphoester bond is present in DNA. T/F

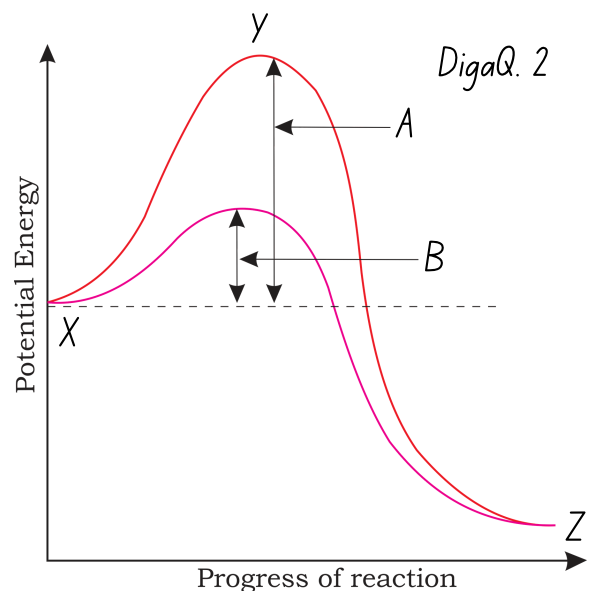
68. % of T in RNA if % of C is 40%?

69. % of A in DNA if % of G is 30 %?

70. In B DNA, at each step, the strand turns \_\_\_\_ degrees.

71. The pitch of B-DNA is \_\_\_\_\_ nm.

72. 6 base pair long DNA have \_\_\_\_\_ nm length.



## • METABOLISM & ENZYMES

73. There is no uncatalysed metabolic conversion in a living system. T/F

74. Metabolic pathways are always circular, not linear. T/F

75. Blood concentration of glucose in normal healthy individual is \_\_\_\_\_ mM.

76. Non proteinaceous enzyme ex - (NEET)

77. Difference between inorganic catalyst and enzymes?

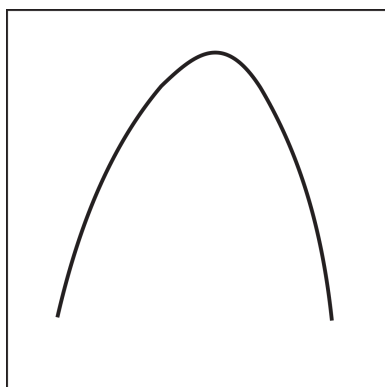
78. Enzyme used to convert water and  $\text{CO}_2$  to  $\text{H}_2\text{CO}_3$  is -

79. The ES complex formation is a transient/non-transient phenomenon.

80. All other intermediate structural states are unstable. T/F

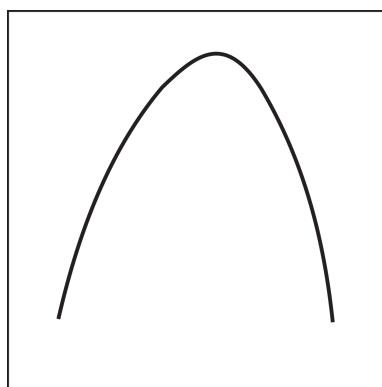
DigaQ. 3

X



Temperature

Y



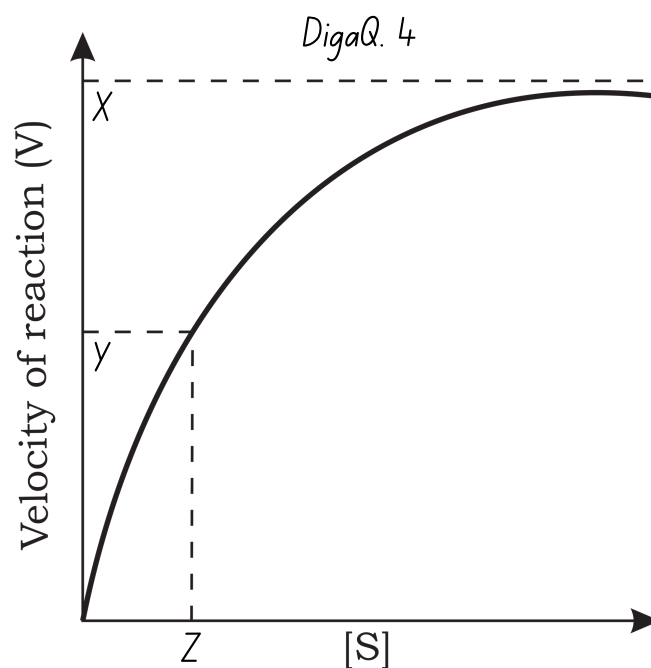
pH



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81. When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as \_\_\_\_\_ (NEET)
82. Ex of competitive inhibition (2)
83. Factors affecting enzyme activity are - (4)
84. Name the 6 classes of enzymes with their example.
85. Name the 3 types of cofactors.
86. \_\_\_\_\_ are organic compounds and are tightly bound to the apoenzyme. (NEET)
87. \_\_\_\_\_ are organic compounds but only transiently bound. (NEET)
88. The essential chemical components of many coenzymes are \_\_\_\_\_. Ex - (1)
89. Zn is a cofactor of - (NEET)



# BIOMOLECULES



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# ANSWERS

## • INTRODUCTION

1. Trichloroacetic acid
2. Cheesecloth or cotton
3. CHONS (Carbon, Hydrogen, Oxygen, Nitrogen, Sulphur)

Element	% Weight of Earth's crust Human body	
Hydrogen (H)	0.14	0.5
Carbon (C)	0.03	18.5
Oxygen (O)	46.6	65.0
Nitrogen (N)	very little	3.3
Sulphur (S)	0.03	0.3
Sodium (Na)	2.8	0.2
Calcium (Ca)	3.6	1.5
Magnesium (Mg)	2.1	0.1
Silicon (Si)	27.7	negligible

4. Methanes
5. Glutamate, Aspartate
6. Lysine, Arginine (Mnemonic - LyAr (Lier))
7. Valine, alanine, glycine, leucine, isoleucine
8. Tyrosine, Phenylalanine, Tryptophan
9. Hermaphrodite, amino acid
10. I5
11. Arachidonic
12. Trihydroxy propane
13. F
14. Phosphatidylcholine (Lecithin), Phosphatidylethanolamine
15. Cell membrane
16. Sphingolipids, sphingosine
17. Sphingolipid, Phosphatidylethanolamine
18. Nucleoside, phosphate
19. Adenosine
20. Cytidine
21. F
22. Alkaloids, flavonoids, rubber, essential oils, antibiotics, coloured pigments, scents, gums, spices
23. Carotenoids, Anthocyanins
24. Morphine, Codeine

25. Monoterpenes, Diterpenes
26. Lemon grass oil
27. Drugs
28. Abrin, Ricin
29. Lectins
30. Vinblastin, curcumin
31. Rubber, gums, cellulose
32. F

Pigments	Carotenoids, Anthocyanins, etc.
Alkaloids	Morphine, Codeine, etc.
Terpenoides	Monoterpenes, Diterpenes etc.
Essential oils	Lemon grass oil, etc.
Toxins	Abrin, Ricin
Lectins	Concanavalin A
Drugs	Vinblastin, curcumin, etc.
Polymeric substances	Rubber, gums, cellulose

33. 18-800
34. proteins, nucleic acids, polysaccharides and lipids
35. M.W. > 1000 Da, found in acid insoluble pool
36. 10,000 Da
37. Macromolecules
38. Cytoplasm

Component	% of the total cellular mass
Water	70-90
Proteins	10-15
Carbohydrates	3
Lipids	2
Nucleic acids	5-7
Ions	1

## • PROTEIN, POLYSACCHARIDE NUCLEIC ACIDS

44. Heteropolymer
45. histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, arginine and valine
46. Enables glucose transport into cells

Protein	Functions
Collagen	Intercellular ground substance
Trypsin	Enzyme
Insulin	Hormone
Antibody	Fights infectious agents
Receptor	Sensory reception (smell, taste, hormone, etc.)
GLUT-4	Enables glucose transport into cells

47. Collagen
48. RuBisCo
49. Fructose
50. Reducing (Trick - R for R)
51. F
52. Helical structure
53. Blue
54. Chitin
55. N-acetyl glucosamine, N-acetyl galactosamine
56. Homopolysaccharide, N-acetyl glucosamine
57. Purines
58. 2'
59. Last
60. First
61. Alpha helix, beta pleated sheets
62. Tertiary structure
63. Myoglobin
64. Haemoglobin
65. 2
66. Esher
67. F
68. 0%
69. 20%
70. 36\*
71. 3.4 nm
72. 2.04 nm

## • METABOLISM & ENZYMES

73. T
74. F, both linear and circular
- 75.4.2 - 6.1 mM
76. Ribozyme
77. Inorganic catalysts work efficiently at high temperatures and high pressures, while enzymes get damaged at high temperatures
78. Carbonic anhydrase
79. Transient
80. T
81. Competitive inhibition
82. inhibition of succinic dehydrogenase by malonate, sulfa drugs for folic acid synthesis in bacteria
83. Temp, pH, Concentration of substrate, Inhibitors
84.
  - 1) Oxidoreductases/dehydrogenases: ex - Lactate dehydrogenase
  - 2) Transferases: ex - Transaminase, Kinase
  - 3) Hydrolases: ex - Amylase, Lipase etc
  - 4) Lyase: ex - Aldolase, carbonic anhydrase
  - 5) Isomerase: ex - phosphoglucose isomerase
  - 6) Ligase: ex - RUBP carboxylase, PEP carboxylase
85. Prosthetic group, Coenzymes, Metal ions
86. Prosthetic group
87. Coenzyme
88. Vitamins ex - niacin
89. carboxypeptidase



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## • DigaQs

DigaQ. 1 - Various levels of Protein Structure

A - Primary

X - Polypeptide

B - Secondary

X - Alpha helix

Y - Beta-plated sheet

C - Tertiary

X - Hydrogen bond

Y - Disulphide bond

D - Quaternary

DigaQ. 2 - Concept of activation energy

X - Substrate

Y - Transition state

Z - Product

A - Activation energy without enzyme

B - Activation energy with enzyme

DigaQ. 3 - Effect of change in pH and Temperature

X - Enzyme activity      Y - Enzyme activity

DigaQ. 4 - Effect of change in concentration of substrate on enzyme activity

X -  $V_{\max}$

Y -  $V_{\max}/2$

Z -  $K_m$



SCAN AND DONATE US SO THAT WE  
CAN CREATE MORE SUCH QUALITY  
CONTENT FOR YOU!

JUST ₹10-20 WILL BE APPRECIABLE! :)

STUDENTS AFTER GETTING THE  
NOTIFICATION OF NEW BIOHACK...



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